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Aliaga Geological Park

menaced by a big wind-energy project

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The geological heritage of the Aliaga Geological Park (Teruel province, Iberian Chain), an emblematic site in Spain, could be affected by a big, environmentally unfriendly wind-energy project. The Aliaga Geological Park, created in 1993 by the municipality of Aliaga and the Zaragoza University, is a pioneering initiative to disseminate and promote geoheritage. It belongs to the Maestrazgo Geopark and was actively involved in founding the European Geoparks Network.

The Aliaga Geological Park constitutes an exceptional viewpoint over the Alpine evolution of the Iberian Chain. A high number of excellent outcrops allows us to observe the complete stratigraphic record from the Upper Triassic up to the Quaternary (specially the Cretaceous and Cenozoic units). The NNW-SSE trending, box shaped Campos-Aliaga anticline represents the axis of the Alpine structure. A second generation of E-W folds superimposed on it gives rise to fold interference structures that are unique in the world for their scale and spectacular nature, as accredited by the scientific literature. Another remarkable geological feature is a system of extensional faults overlaid by a Lower Cretaceous unconformity and folded within the Campos-Aliaga anticline. The overall relief of this area represents a magnificent example of structural modelling, which faithfully reflects the geological constitution of the terrain and is, therefore, a privileged place to read the geology in the landscape itself.

The "Muela de Vilomar" wind power project, with 9 wind turbines 200 m high, which is intended to install in the very heart of the Geological Park, has been submitted to public information. This is still a preliminary consultation procedure, it is not the final project, but the Aragón regional administration has already received the message that the scientific community is rationally opposed to it. The so-called Platform in favour of the Landscapes of Teruel has presented to INAGA (Aragonese Environmental Management Institute) a written statement opposing the project, signed by seven entities and 150 people from the scientific community. ProGEO is one of the scientific organizations that has given support to that document, together with SGE (Spanish Geological Society), AEPECT (Spanish Association for the Teaching of Earth Sciences) and SEDPGYM (Spanish Society for the Defence of Geological and Mining Heritage), among others.

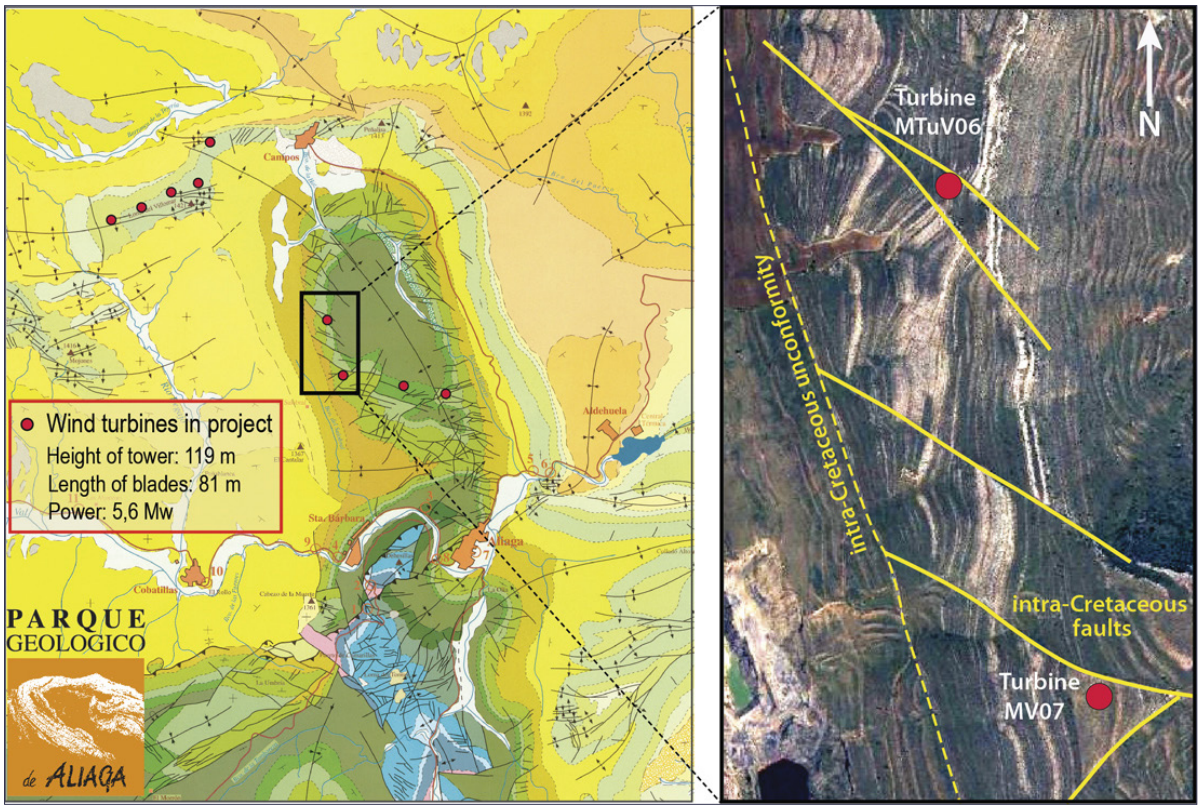

Figure 1 - Geological map of the Aliaga Geological Park, showing location of the wind turbines in project. Right: Detail of location of two turbines on intra-Cretaceous extensional faults at the western limb of the Campos-Aliaga anticline

The document presented to INAGA puts forward the following arguments against the project:

1) Based on Spanish Law 42/2007 on Natural Heritage and Biodiversity, natural heritage includes geological heritage and geodiversity. Article 49 of this Law states that: "All those natural areas that are formally designated in accordance with the provisions of the international conventions and agreements to which Spain is a party and, in particular, the Geoparks declared by UNESCO, shall be considered as protected areas by international instruments". Consequently, the whole Maestrazgo Geopark is expressly protected, although it has yet to be fully developed by the Aragon regional government. Nevertheless, the status of the Geopark as a protected area has been de facto recognized: (i) Decree 1/2015 of the Aragon Government recognizes Geoparks among the so-called Singular Natural Areas; (ii) Decree 274/2015 states: "There are also two Geoparks in Aragon: the Maestrazgo Cultural Park (whose scope includes the Aliaga Geological Park) and the Sobrarbe County Geopark, declared under the UNESCO Geoparks Programme".

2) Decree 274/2015 of the Aragon Government declares the Inventory of Sites of Geological Interest (LIGs), "with a legal status aimed at the protection of their intrinsic values due to their geological content, based on their importance, representativeness, uniqueness and rarity, state of conservation and fragility". The area of the Aliaga Geological Park has several LIGs in Annex I (points) and Annex II (areas). But it also constitutes, in its entirety, a LIG included in Annex IV (observation sites and circuits).

3) The wind power project would directly affect the Campos-Aliaga anticline, one of the most singular structures of the Aliaga Geological Park, and other geological elements associated to it, such as the extensional faults overlaid by a Lower Cretaceous unconformity. The overall geological landscape would also be impaired.

4) The direct visual impact of the wind turbines, as well as the impact of the earthworks required for the construction of the access roads and the foundations and assembly platforms, would represent the destruction of the values of a geological landscape in the centre of the Aliaga Geological Park. The aggressive profile of nine high wind turbines on top of the hills would drastically break the horizon line and the pattern and harmony of the relief. Equally worrying are the earthworks that would be necessary for the foundations of the wind turbines themselves and to build the access roads to them. Building 8.2 km of roads 8 m wide across areas of rugged topography and rocky substratum, needed for giving access to the selected points for heavy vehicles, would require enormous earthworks that would involve major modification of the topography. Some ridges and hills should be flattened by several metres, while heavy excavation of slopes and dumping of the mobilised material in embankments would cover part of the natural terrain. All this would result in a significant activation of soil erosion, negative effects on vegetation, and an irreversible deterioration in the quality of the geological outcrops.

5) Article 12 of Decree 274/2015 of the Aragon Government details the uses and activities prohibited in LIGs: "All uses or activities that are incompatible with the purposes of protection of the Site of Geological Interest of Aragon and pose an actual or potential, direct or indirect danger to the Site or any of its elements or values are considered prohibited uses or activities", in particular, "new road, energy and telecommunication infrastructures". The "Muela de Vilomar" wind power project can be considered an energy infrastructure affected by the prohibition.

6) The reality of the natural and cultural heritage of the Geological Park of Aliaga and the Maestrazgo Geopark, its legal recognition and protection, and the actions carried out for almost three decades to enhance it for tourism cannot be ignored. It is an outstanding pioneering example at a national and international level that should be strictly protected. The Study of Environmental Impact of the wind power project should honestly consider Alternative 0, i.e. the abandonment of the project. This is the most sensible option, and the only one consistent with the preservation of the natural and cultural values that society and the authorities have been recognising and promoting for decades. It is imperative that rigorous land-use planning be undertaken to leave room for the conservation of areas of special interest for landscape, environmental and, as in this case, geological reasons.

Figure 2 - La Olla vertical anticline, one of the most conspicuous components of the geological landscape of Aliaga

ProGEO has participated
in the IUCN World Conservation Congress

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The General Assembly of IUCN has approved Resolution WCC-2020-Res-074 relative to "Geoheritage and Protected Areas". This Resolution supports the development of a detailed study envisaging the establishment of a future IUCN initiative on Key Geoheritage Areas (KGAs), as a complement to the existing Key Biodiversity Areas Programme, in order to protect geoheritage sites of global conservation significance and move towards more integrated nature conservation, among other interesting issues.

The IUCN World Conservation Congress is where the world comes together to set priorities and drive conservation and sustainable development action. IUCN membership has 1400+ organisations representing governments, civil society and indigenous people. Members vote on major issues and actions, which guides the relationship between humans and our planet Earth for the decades ahead. IUCN postponed this congress from 2020 due to the COVID-19 pandemic and was a hybrid, in-person and virtual environmental event.

The General Assembly of IUCN has adopted Resolution WCC-2020-Res-074 "Geoheritage and Protected Areas" with 97% of favourable votes. WCC-2020-Res-074 results of the merging of three different but convergent motions:

- "Geoheritage, protected areas and Key Geoheritage Areas", proposed by ProGEO (http://www.progeo.ngo/).
- "Bringing geological substrate, landforms and active geological processes into the management of Protected Areas", proposed by the Spanish Geological Society (https://sge.usal.es/comisiones_patrimonio.html).
- "Take greater account of natural cavities in nature protection policies", proposed by Réserves Naturelles de France (https://www.reserves-naturelles.org/), within the framework of IFREEMIS (https://www.ifreemis.com/).

WCC-2020-Res-074 considers that human well-being and survival depend on the elements and processes of both geodiversity and biodiversity and notes the growing commitment with respect to the preservation, study and sustainable use of geoheritage. It also recognizes that the main geodiversity elements directly influencing biodiversity are geological substrates, which determine hydrology, erosion, nutrients, the chemistry of soils, and vegetation health and cover; landforms, which determine climate, hydrology, soils and habitats and species distributions; and active geological processes, which determine habitats and species distributions and survival. Besides that, it also takes into account that selected geodiversity elements and processes, designated as geoheritage, play a crucial role in underpinning biodiversity conservation and the conservation of protected areas, as well as providing other scientific, conservation and ecosystem-service benefits.

WCC-2020-Res-074 considers the specificity of natural cavities resulting from complex dynamic processes linking the Earth's surface and underground rocks. It recognizes the biological and geological interest in natural cavities, which combine endo-karstic and volcanic geological formations with terrestrial and aquatic habitats, and which support fauna, flora and fungi specific to these environments, and include elements and landscapes without any equivalent on the Earth's surface. Moreover, WCC-2020-Res-074 recalls that underground environments remain largely unknown because they are invisible to most people and hard to access, and are a pioneering frontier for scientific research and discoveries.

In addition, IUCN recalls the main resolutions adopted during the previous decade:

- WCC-2008-Res-4.040 Conservation of geodiversity and geological heritage (Barcelona, 2008).
- WCC-2012-Res-5.048. "Valuing and conserving geoheritage" (Jeju, 2012).
- WCC-2016-Res-6.041 Identifying Key Biodiversity Areas for safeguarding biodiversity (Hawai'i,2016), which reveals that identifying, promoting and protecting geodiversity is missing in the global conservation agenda;
- WCC-2016-Res-6.063 Avoiding extinction in limestone karst areas (Hawai'i, 2016).
- WCC-2016-Res-6.083 Conservation of moveable geological heritage (Hawai'i, 2016).

The WCC-2020-Res-074 Resolution request:

To the Director General and WCPA:

- To mobilize IUCN Regional Offices and the IUCN Global Programme in support of national efforts to collect, compile and publish data on geoheritage and geodiversity in protected areas, including proper inventories, research, and sustainable management and protection of geological substrate, landforms and active geological processes.
- To support the development of a detailed study envisaging the establishment of a future IUCN initiative on Key Geoheritage Areas, as a complement to the existing Key Biodiversity Areas programme, in order to protect geoheritage sites of global conservation significance and move towards more integrated nature conservation.
- To encourage work, including by protected area managers, to enhance the information and proper interpretation of geodiversity and geoheritage in order to increase the awareness of visitors of all natural features inside natural cavities and protected areas and the ways in which geological, biological and cultural elements are often inter-linked.
- To engage with the Commission on Ecosystem Management (CEM) to encourage a concerted effort to conduct ecosystem Red List assessments of geologically interesting ecosystems, and to incorporate geoheritage assessments as part of the normal procedure for red-listing and ecosystem assessments.

To the national Member organizations, other nature conservation organisations, civil society, academia and managers of protected areas and outstanding underground sites:

- To foster knowledge about geodiversity and geoheritage inside and outside protected areas, and to integrate nature conservation principles and methods into the management of protected areas to ensure the effective protection of this component of natural heritage.
- To establish or improve national legislation concerning the protection of geoheritage, and enabling the necessary conditions to ensure the implementation of effective conservation measures.
- To encourage the respectful exploration and study of underground environments and their interrelations with the surface.

To the states, non-governmental organizations, universities, researchers, economic stakeholders and protected area managers:

- To take into account the specific issues linked to underground environments in the definition and implementation of nature conservation policies.
- To adopt a holistic approach to the management of underground natural environments considering all relationships between biological and geological elements.

The IUCN Congress adopted more than 136 resolutions. In some of them, geodiversity and geological heritage have been taken into account so we could say that geoconservation is slowly penetrating the thinking, policies and strategies of IUCN (https://portals.iucn.org/library/resrec/search).

This event was also an opportunity to ProGEO hold a high-level meeting with the newly elected IUCN President, Mrs. Razan Al-Mubarak. ProGEO was able to directly express its concerns regarding geoconservation on a global scale and propose a path to geoconservation within the IUCN. Moreover, within the Congress, IFREEMIS together with other promotors kindly invited ProGEO to participate in an in-person and online event to present WCC-2020-Res-074.

The WCC-2020-Res-074 Resolution opens the way to ProGEO and other geo-conservationist organisations to work within IUCN, together with other NGOs, civil society, academia and managers of protected areas, fostering the importance of geoheritage and geodiversity for present and future generations.

Ten years

Brazilian Symposium on Geological Heritage

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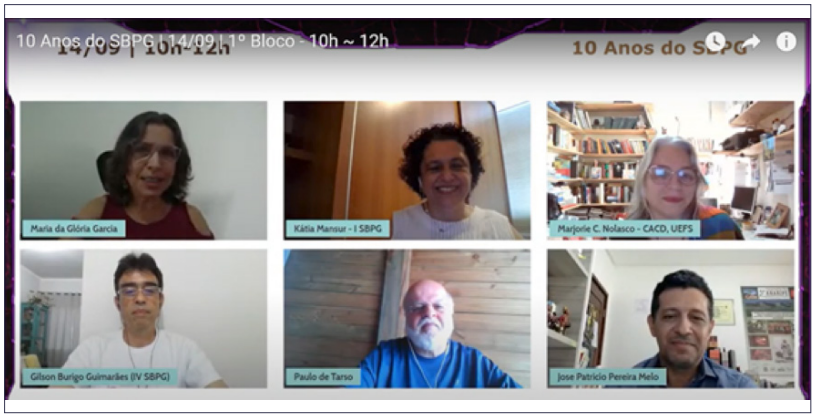
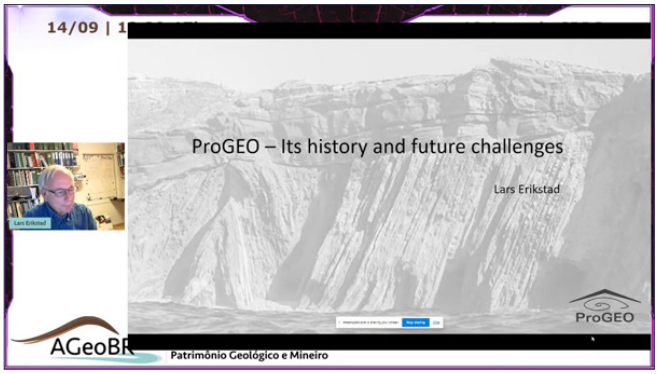
Ten years ago, the first edition of the Brazilian Symposium on Geological Heritage (BSGH) took place. The debut of what is today the biggest national event in the field of Geoconservation was in Rio de Janeiro. The city, which received the title of UNESCO world heritage in the cultural landscape category in 2012, hosted an event full of news, which mobilized the geoconservationist community in Brazil.

On September 14, 2021 the Brazilian Association for the defense of Geological and Mining Heritage (AGeoBR) promoted an event to commemorate this date. It was an event marked by many memories and debates about the trajectory and future of geoconservation in the country.

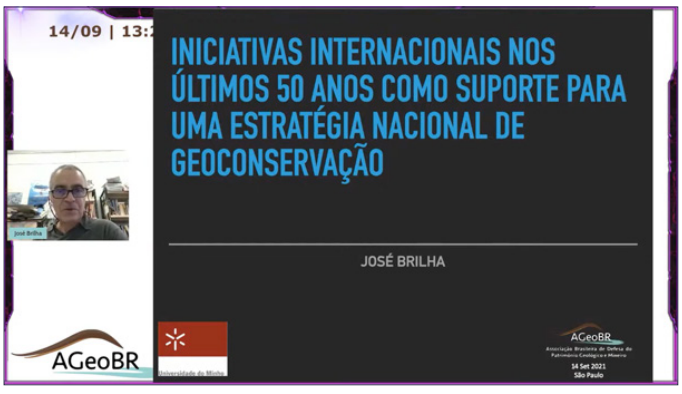


In the morning, the first panel debate took place, entitled "10 years of BSGH: from the first edition to the present". The activity was attended by the coordinators of the five previous symposia, who presented an overview of each of the events: 2011 - Kátia Leite Mansur (Federal University of Rio de Janeiro), 2013 - Paulo de Tarso Amorim Castro (Federal University of Ouro Preto), 2015 - Marjorie Cseko Nolasco (State University of Feira de Santana), 2017 - Gilson Burigo Guimarães (State University of Ponta Grossa) and 2019 - Patrício Melo (Araripe UNESCO Global Geopark). All presenters highlighted the role of universities in promoting the SBPG.



The afternoon session began with a lecture by Lars Erikstad, current president of the International Association for the Protection of Geological Heritage (ProGEO). The lecture was entitled "ProGEO - its history and future challenges". Lars addressed the facts that gave rise to the association, created in 1993. Throughout the presentation, the researcher emphasized the various advances in geoconservation in different countries and the cooperation of ProGEO in organizing several important events in which the theme of geoconservation was highlighted. Finally, the highlights was the perspectives regarding the recent modification in the association, which went from European to international, approved during the 10th symposium that took place virtually, organized by Spain in 2021.

In our third activity, José Brilha, from the University of Minho, participated with the lecture "International initiatives in the last 50 years as support for a national geoconservation strategy". Professor Brilha presented us with a historical line of various global actions related to nature conservation, such as the UNESCO Programs "Man and Biosphere" and "World Heritage Sites", in the 1970s, until the creation of the "World Geoparks" Program of UNESCO", in 2015. He pointed out how these actions can contribute to the implementation of local geoconservation strategies.



Caves and Karst International Year

by: **George Veni**
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The past month has been very busy and important. On Monday, 13 September 2021, we celebrated the International Year at UNESCO Headquarters in Paris. Many governmental ambassadors and influential people were at the meeting in Paris. Many of you attended by Zoom and YouTube and we thank you for joining us. Your attendance was important to show broad support for the International Year.

We asked UNESCO for three specific things (in additional to general support in their representatives' countries):

- Encouraged UNESCO to develop inventories of all caves, karst features, and their contents in UNESCO protected areas.
- Suggested that UNESCO evaluate protected areas for adequacy of cave and karst protection, and expand protection as needed.
- Invited UNESCO to join the UIS to develop an international ban in the trade of cave materials (speleothems, animals, sediments, and rocks).

The first two requests apply to everyone who manages and protects cave and karst lands, not just UNESCO protected areas. The third request is a new initiative of the UIS. We are seeking partners to help us develop the exact text of an international ban and partners to promote and have it broadly accepted.

Overall, the celebration at UNESCO was important and a major accomplishment, but now the real work starts. We must turn that meeting into tangible results for caves and karst. We are following up with UNESCO officials and will continue to need your support.

To watch the celebration and all International Year videos, go tohttps://www.youtube.com/channel/UCzSiErLj5x6viNbvAdehDvA. For more information about the International Year, visit the website (www.iyck2021.org).

We currently have 243 International Year partners from 50 countries! On behalf of the UIS, I thank all of you for your support. As a reminder, please continue to plan and announce your International Year events and activities athttp://iyck2021.org/index.php/events/. Even more importantly, when your event is over please update your announcement by adding an Event Report. This can be a short few lines about the number of people who attended and what was done. Even better is a link to a YouTube video of the event, or a link to social media. Best of all is to have news media at your events and provide links to their stories. This will help spread information about caves and karst much further than what we do individually.

If you have any questions or needs, please let me know. And if you know other organizations that might join as partners, please tell them about the International Year and invite them!

Wishing all ProGEO members a joyful and peaceful season and a happy New Year 2022

Lågøystolane (Norway). (fjordkystparken.no) Photo: Lars Erikstad

Deadline next issue of ProGEO NEWS

February 20th, 2022

Please send contributions to ProGEO NEWS. Members are interested in things that happen all over the world, your experiences, activities, science, geosites, geoconservation and geotourism efforts!

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Please send your contributions (unformatted word file 500 – 2000 words). Photographs, maps and figures should be sent as separated files (preferentially not included in the word file).

If longer texts are needed, please contact the editor.

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